REMARKS

Entry of this amendment and reconsideration of this application as so amended are requested. By this amendment applicant has amended the specification to correspond to the specification as originally filed with a couple of obvious changes, as indicated below, without introducing new matter; and has amended claims 1-6 accordingly and canceled claims 8 and 9 as being redundant. Claims 1-6 remain in the case.

Applicant's claimed invention is a simple method of demultiplexing a statistically multiplexed MPEG transport stream (MTS) into constant bit rate (CBR) single program transport streams (SPTS) without making any changes to the variable bit rate (VBR) video elementary streams, i.e., without transcoding the video elementary streams. The basic concept is to send each picture or frame of the video elementary stream at a fixed interval before it is intended to be decoded, or as soon as possible thereafter. The packets for each SPTS(VBR) stream, after separation from the MTS based upon packet identifiers (PIDs), are input to a smoothing buffer for transfer at a constant bit rate for subsequent decoding. The buffer may be considered to have a plurality of equal capacity slots between consecutive decode time stamps (DTS) of successive frames of the video. At a time δ before the DTS for each frame the corresponding frame data packet is entered into one of the successive slots of the buffer. If the amount of frame data input exceeds the slot capacity, then the next frame is input immediately upon completion of the input of the prior frame data. If the amount of frame data input is less than the slot capacity, the next frame waits for loading into the buffer until the time δ before its DTS. Thus the video pictures or frames are loaded into the smoothing buffer as early as possible up to a fixed time interval before the pictures need to be decoded, i.e., at a fixed time interval before each picture's DTS for transfer at a constant bit rate for decoding. The smoothing buffer provides the ability to transform a SPTS(VBR) stream demultiplexed from the MTS stream into a SPTS(CBR) stream for decoding.

As is clear the present invention operates on the transport streams and not the individual elementary streams that make up the single program transport stream. This appears to be where the confusion has arisen between applicant and the examiner. The variability of the SPTS(VBR) is illustrated in Fig. 1 where the first few packets of an SPTS stream occur at 3.333333Mbs within the 10Mbs CBR MTS while the last few occur at 10Mbs. These packets are loaded into the smoothing buffer in time slots corresponding to a time δ before the DTS for the frames/pictures represented by the packets. The SPTS is then transferred from the smoothing buffer to be decoded at DTS at the desired constant bit rate (such as 6Mbs), but since the packets are loaded into the SPTS early relative to the DTS they are complete and available for

decoding at DTS so that none of the pictures are lost, minimizing the requirement of replacing B-type pictures with null B-type pictures (freeze frames) as occurred in the prior art when the pictures were not completely received by the indicated DTS directly from the MTS. Fig. 3 shows how the smoothing buffer, or CBR MTS packet buffer, is loaded with the SPTS packets.

The amendments made to the specification that deviate from the original specification at page 3, line 9 and page 4, line 5 are to clarify that the SPTS is loaded into the smoothing buffer and output for decoding at the constant bit rate. Page 4, line 11 is changed to read "greater than the desired CBR" to be consistent with the Background, page 1, lines 15-17.

Once it is understood that the present invention relates to buffering transport streams, it becomes apparent that Haskell is non-analogous prior art since Haskell deals with decoding a single program transport stream, not buffering the SPTS prior to decoding. Haskell deals with timing recovery from the SPTS in a decoder and does not address the issue of buffering the SPTS picture packets prior to input to the decoder to assure as well as possible that the packets for each picture are received early and provided at DTS for decoding to minimize the requirement for replacing B-type pictures with null B-type pictures because the picture packets are not completely received prior to DTS. All the references to the buffers in Haskell relate to elementary stream buffers, not a transport stream buffer.

Haskell has a constant bit rate single program transport stream as an input and then decodes the video and audio. This would occur after the smoothing buffer recited by applicant in claims 1 and 4. Haskell neither teaches nor suggests that there is a smoothing buffer prior to the decoder such that the input single program transport stream is transcoded from a VBR to a CBR transport stream, the frames of the single program transport stream being loaded into the smoothing buffer at a time "delta" prior to the DTS associated with the frame. Haskell merely compensates for system clock jitter within the single program transport stream during the decoding process.

Specifically Haskell receives a single program transport stream at a constant bit rate from a statistically multiplexed MPEG transport stream without buffering. However applicant recites in claim 1 that the pictures of the transport stream are loaded into a smoothing buffer a specified amount of time prior to the DTS and then transferred from the smoothing buffer for decoding at the DTS. Contrary to the examiner's conclusion, the video buffer 202 of Haskell is not a transport stream smoothing buffer but is part of the decoding process. Claim 4 likewise recites loading the pictures into a smoothing buffer and then transferring them for decoding at a rate that does not exceed the constant bit rate. Claim 4 also recites that the pictures are loaded at a specified time prior to DTS. Zhu also does not disclose or teach

this buffering of the transport stream by storing in a smoothing buffer "delta" prior to the DTS and transmitting for decoding at the DTS. Thus claims 1 and 4 together with claims 2-3, 5 and 6 dependent therefrom are deemed to be allowable.

In view of the foregoing remarks entry of this amendment and allowance of claims 1-6 are urged, and such action and the issuance of this case are requested.

Respectfully submitted,

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